

WHAT IS CLAIMED IS:

1. A diesel fuel, the diesel fuel comprising a base fuel and an additive for reducing a pollutant emission, the additive comprising:

a plant oil extract;  
an antioxidant; and  
a thermal stabilizer.

2. The diesel fuel of claim 1, wherein the plant oil extract comprises an oil extract of a plant of the *Leguminosae* family.

3. The diesel fuel of claim 1, wherein the plant oil extract is selected from the group consisting of oil extract of vetch and oil extract of barley.

4. The diesel fuel of claim 1, wherein the plant oil extract comprises chlorophyll.

5. The diesel fuel of claim 1, wherein the antioxidant comprises  $\beta$ -carotene.

6. The diesel fuel of claim 1, wherein the thermal stabilizer comprises jojoba oil.

7. The diesel fuel of claim 1, wherein the thermal stabilizer comprises an ester of a C20-C22 straight chain monounsaturated carboxylic acid.

8. The diesel fuel of claim 1, wherein the plant oil extract comprises oil extract of vetch, wherein the antioxidant comprises  $\beta$ -carotene, and wherein the thermal stabilizer comprises jojoba oil.

9. The diesel fuel of claim 1, further comprising a diluent.

10. The diesel fuel of claim 9, wherein the diluent is selected from the group consisting of toluene, diesel fuel, diesel fuel, jet fuel, and mixtures thereof.

11. The diesel fuel of claim 1, further comprising an oxygenate.

12. The diesel fuel of claim 11, wherein the oxygenate is selected from the group consisting of methanol, ethanol, methyl tertiary butyl ether, ethyl tertiary butyl ether, and tertiary amyl methyl ether, and mixtures thereof.

13. The diesel fuel of claim 1, further comprising at least one additional additive selected from the group consisting of cetane improvers, detergents, corrosion inhibitors, metal deactivators, ignition accelerators, dispersants, anti-knock additives, anti-run-on additives, anti-pre-ignition additives, anti-misfire additives, antiwear

additives, antioxidants, demulsifiers, carrier fluids, solvents, fuel economy additives, emission reduction additives, lubricity improvers, and mixtures thereof.

14. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is from about 8.1:1 to about 4.0:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is from about 3.0:1 to about 2.0:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is from about 2.7:1 to about 1.7:1.

15. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is from about 8.1:1 to about 4.8:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is from about 3.0:1 to about 2.4:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is from about 2.7:1 to about 2.0:1.

16. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is about 8.1:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is about 3.0:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is about 2.7:1.

17. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is about 6.1:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is about 2.7:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is about 2.3:1.

18. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is about 4.8:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is about 2.4:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is about 2.0:1.

19. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is from about 6.1:1 to about 4.0:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is from about 2.7:1 to about 2.2:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is from about 2.3:1 to about 1.8:1.

20. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is about 4.8:1, wherein a ratio of grams of

oil extract of vetch to milliliters jojoba oil in the diesel fuel is about 2.4:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is about 2.0:1.

21. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is about 6.1:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is about 2.7:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is about 2.3:1.

22. The diesel fuel of claim 8, wherein a ratio of grams of plant oil extract of vetch to grams of  $\beta$ -carotene in the diesel fuel is about 4.0:1, wherein a ratio of grams of oil extract of vetch to milliliters jojoba oil in the diesel fuel is about 2.2:1, and wherein a ratio of milliliters jojoba oil to grams of  $\beta$ -carotene in the diesel fuel is about 1.8:1.

23. The diesel fuel of claim 8, comprising from about 0.0021 ml to about 0.0058 ml jojoba oil per 3785 ml of diesel fuel, from about 0.0013 g to about 0.0032 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and from about 0.0061 g to about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

24. The diesel fuel of claim 8, comprising from about 0.0046 ml to about 0.0053 ml jojoba oil per 3785 ml of diesel fuel, from about 0.0016 g to about 0.0026 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

25. The diesel fuel of claim 8, comprising about 0.0042 ml jojoba oil per 3785 ml of diesel fuel, about 0.0016 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

26. The diesel fuel of claim 8, comprising about 0.0047 ml jojoba oil per 3785 ml of diesel fuel, about 0.0021 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.0026 g oil extract of vetch per 3785 ml of diesel fuel.

27. The diesel fuel of claim 8, comprising about 0.0053 ml jojoba oil per 3785 ml of diesel fuel, about 0.0026 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

28. The diesel fuel of claim 8, comprising from about 0.0024 ml to about 0.0058 ml jojoba oil per 3785 ml of diesel fuel, from about 0.0013 g to about 0.0032 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and from about 0.0061 g to about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

29. The diesel fuel of claim 8, comprising about 0.0025 ml jojoba oil per 3785 ml of diesel fuel, about 0.0013 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.0061 g oil extract of vetch per 3785 ml of diesel fuel.

30. The diesel fuel of claim 8, comprising about 0.0048 ml jojoba oil per 3785 ml of diesel fuel, about 0.0021 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

31. The diesel fuel of claim 8, comprising about 0.0058 ml jojoba oil per 3785 ml of diesel fuel, about 0.0032 g of  $\beta$ -carotene per 3785 ml of diesel fuel, and about 0.013 g oil extract of vetch per 3785 ml of diesel fuel.

32. The diesel fuel of claim 1, wherein the diesel fuel comprises a reformulated diesel fuel.

33. The diesel fuel of claim 1, wherein the diesel fuel comprises a No. 2 low sulfur diesel fuel.

34. The diesel fuel of claim 1, wherein the diesel fuel has a sulfur content less than or equal to 500 ppm.

35. A method for producing a diesel fuel, the method comprising the steps of:

preparing a first additive by combining  $\beta$ -carotene, jojoba oil, and a diluent, the first additive comprising about 4 ml jojoba oil and about 4 g  $\beta$ -carotene per 3785 ml of the first additive;

preparing a second additive by combining a oil extract of vetch, jojoba oil, and a diluent, the second additive comprising about 4 ml jojoba oil and about 19.36 g oil extract of vetch per 3785 ml of the second additive; and

adding the first additive and the second additive to a base fuel to produce a diesel fuel, such that the diesel fuel comprises from about 1.2 ml to about 3.0 ml of the first additive per 3785 ml of diesel fuel and about 2.5 ml of the second additive per 3785 ml of diesel fuel.

36. A method for producing a diesel fuel, the method comprising the steps of:

preparing a first additive by combining  $\beta$ -carotene, jojoba oil, and a diluent, the first additive comprising about 32 ml jojoba oil and about 32 g  $\beta$ -carotene per 3785 ml of the first additive;

5 preparing a second additive by combining a oil extract of vetch, jojoba oil, and a diluent, the second additive comprising about 32 ml jojoba oil and about 155 g oil extract of vetch per 3785 ml of the second additive; and

10 adding the first additive and the second additive to a base fuel to produce a diesel fuel, such that the diesel fuel comprises from about 0.15 ml to about 0.375 ml of the first additive per 3785 ml of diesel fuel and about 0.313 ml of the second additive per 3785 ml of diesel fuel.

37. A method for operating a vehicle equipped with a diesel fuel-powered engine, the method comprising the step of:

15 combusting a diesel fuel in the engine such that a quantity of a pollutant is produced, wherein the diesel fuel comprises a base fuel, a plant oil extract, an antioxidant, and a thermal stabilizer, and wherein the quantity of the pollutant produced by combustion of 3785 ml of the diesel fuel is less than a quantity of the pollutant produced upon combustion of 3785 ml of the base fuel.